CLAIMS

1. A method for virtually concatenating optical channels in WDM networks, the method comprising the steps of:

- providing for à plurality of frames, each frame comprising a byte reserved for a concatenation flag;
- writing the same value defined in advance into the n-frame (n=1,2,3,...) concatenation byte; and
- transmitting the n frames through n respective channels.

2. A method for receiving a number n of virtually concatenated signal frames in WDM networks, the method comprising the steps of:

- receiving a first reference frame at an instant t_o;
- reading the concatenation byte value of such reference frame;
- receiving the remaining n-1 signal frames after a respective determined time t;
- reading the concatenation byte value of the remaining n-1 signal frames; and
- identifying and aligning all the signal frames with the same concatenation byte value compensating for the receiving time t.

3. A method according to claim 2, wherein the step of aligning all the signal frames with the same concatenation byte value comprises the steps of:

- receiving the remaining n-1 signal frames at corresponding instants t_1;
- calculating, for each of the remaining n-1 frames, the time t elapsed from the instant at which the reference frame has been received;
- providing, for every channel, an elastic store; and
- holding steady the elastic storage of the reference channel and moving the others in dependence of the calculated times t.

4. A method according to claim 2, wherein the step of receiving the remaining n-1 signal frames after a respective determined time t comprises the steps of:

- reading the frame alignment word of the reference frame at a first instant t_o;

- reading the frame alignment word of the remaining n-1 frames at corresponding second instants t_1; and

- calculating the time differences t between the first instant t_o and the corresponding second instants t1.

5. A method according to any of claims 2 to 4, wherein the additional step is provided of calculating the possible differences between the concatenation byte value of the reference frame and the concatenation byte value of the remaining n-1 frames, multiplying such possible differences by the frame period T and adding the value obtained to the respective time differences t.

6. An apparatus for virtually concatenating optical channels in WDM networks, the apparatus comprising:

- a first circuit for writing the same predetermined value into the concatenation byte of n-signal frames (n=1,2,3,...) : and

- a transmitter of the n frames through n respective channels.

7. An apparatus for receiving a number n of signal frames virtually concatenated in WDM networks, the apparatus comprising:

- a first receiver of a first reference frame at an instant t_o;

- a first circuit for reading the concatenation byte value of such reference frame;

- a second receiver of the remaining n-1 signal frames after a respective determined time t;

- a second circuit for reading the concatenation byte value of the remaining n-1 frames; and

- a circuit for identifying and aligning all the signal frames with the same concatenation byte value compensating for the receiving times t.

8. A WDM network comprising circuits for the implementation of the method for virtually concatenating optical channels of claim 1.

9. A WDM network comprising circuits for the implementation of the method for receiving a number n of virtually concatenated signal frames of claim 2.

10. A WDM network comprising an apparatus for virtually concatenating optical channels as in claim 6.

11. WDM network comprising an apparatus for receiving a number n of virtually concatenated signal frames as in claim 7.